

Claims

[1] A light source device comprising: a light conductor which has a first light incident end surface and a second light incident end surface that extend in substantially parallel directions relative to each other and that are positioned on mutually opposite sides, and a light emitting surface; a first primary light source and a second primary light source which are disposed respectively adjacent to said first light incident end surface and said second light incident end surface; and a light deflecting element which has a light incident surface disposed facing said light emitting surface and a light emitting surface positioned on the side opposite from this light incident surface, wherein

a directional light emitting functional part with an average inclination angle of 0.5 to 15° is formed on at least one surface of said light conductor, i.e., the light emitting surface or the back surface positioned on the side opposite from this light emitting surface,

a plurality of mutually parallel prism rows that extend in a direction substantially parallel to said first light incident end surface and said second light incident end surface are formed on the light incident surface of said light deflecting element, each of these prism rows has a first prism surface on the side close to said first primary light source and a second prism surface on the side close to said second primary light source,

said first prism surface has a first region that extends in the direction of extension of said prism rows and a second region that extends in the direction of extension of said prism rows,

the vertical angle of the prism rows is 80 to 120° , the difference in the angle of inclination between said first region and said second region is 5 to 20° , and said second region has a smaller angle of inclination with respect to the normal direction of the prism row formation plane than said first region.

[2] The light source device according to Claim 1, wherein said second region is positioned further from the top part of said prism rows than said first region.

[3] The light source device according to Claim 1, wherein the ratio of the width of said second region to the width of said prism rows in the cross section perpendicular to the direction of extension of said prism rows is 10 to 40% .

[4] The light source device according to Claim 1, wherein at least one surface among said first region, said second region and said second prism surface consists of a single plane or curved surface.

[5] The light source device according to Claim 1, wherein said first region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the direction forming the first angle with respect to the normal direction of said prism row formation plane, said second region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction, and said second prism surface deflects (by inside surface reflection) at least the light that is emitted from said light emitting surface and introduced into said prism rows from said first prism surface in the direction forming the second angle with respect to the normal direction of said prism row formation plane.

[6] The light source device according to Claim 5, wherein said second angle is positioned on the opposite side of the normal direction of said prism row formation plane from said first angle.

[7] The light source device according to Claim 5, wherein the direction forming said second angle is said normal direction or a direction in the vicinity of said normal direction.

[8] The light source device according to Claim 1, wherein said second prism surface has a third region extending in the direction of extension of said prism rows and a fourth region extending in the direction of extension of said prism rows, the difference in the angle of inclination between said third region and said fourth region is 5 to 20°, and said fourth region has a smaller inclination angle with respect to the normal direction of the prism row formation plane than said third region.

[9] The light source device according to Claim 8, wherein said fourth region is positioned further from the top part of said prism rows than said third region.

[10] The light source device according to Claim 8, wherein the ratio of the total of the width of said second region and the width of said fourth region to the width of said prism rows in the cross section perpendicular to the direction of extension of said prism rows is 10 to 40%.

[11] The light source device according to Claim 8, wherein at least one region among said first region, said second region, said third region and said fourth region consists of a single plane or curved surface.

[12] The light source device according to Claim 8, wherein said first region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the direction forming the first angle with respect to the normal direction of said prism row formation plane, said second region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction, and said second prism surface deflects (by inside surface reflection) at least the light that is emitted from said light emitting surface and introduced into said prism rows from said first prism surface in the direction forming the second angle with respect to the normal direction of said prism row formation plane.

[13] The light source device according to Claim 12, wherein said second angle is positioned on the opposite side of the normal direction of said prism row formation plane from said first angle.

[14] The light source device according to Claim 12, wherein the direction forming said second angle is said normal direction or a direction in the vicinity of this normal direction.

[15] The light source device according to Claim 12, wherein said third region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said first prism surface in the direction forming the second angle with

respect to the normal direction of said prism row formation plane, and said fourth region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said first prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction.

[16] The light source device according to Claim 15, wherein said second angle is positioned on the opposite side of the normal direction of said prism row formation plane from said first angle.

[17] The light source device according to Claim 15, wherein the direction forming said second angle is said normal direction or a direction in the vicinity of this normal direction.

[18] The light source device according to any of Claims 1 through 17, wherein said light conductor causes the emission of light in at least two directions, both with peak light in the luminosity distribution of the emitted light from the light emitting surface having full widths at half maximum of 10 to 50° in directions of 50 to 80° on mutually opposite sides with respect to the normal of the light emitting surface.

[19] A light source device comprising: a light conductor which has a light incident end surface that is one of two end surfaces extending in substantially parallel directions relative to each other and positioned on mutually opposite sides, and a light emitting surface; a primary light source which is disposed adjacent to said light incident end surface; and a light deflecting element which has a light incident surface disposed facing said light emitting surface and a light emitting surface positioned on the side opposite from this light incident surface, wherein

a directional light emitting functional part with an average inclination angle of 0.5 to 15° is formed on at least one surface of said light conductor, i.e., the light emitting surface or the back surface positioned on the side opposite from this light emitting surface,

a plurality of mutually parallel prism rows that extend in a direction substantially parallel to said light incident end surface are formed on the light incident surface of the light deflecting element, each of these prism rows has a first prism surface on the side close to said primary light source and a second prism surface on the side distant from said primary light source,

said first prism surface has a first region which extends in the direction of extension of said prism rows and a second region which extends in the direction of extension of said prism rows,

the vertical angle of the prism rows is 50 to 90°, the difference in the angle of inclination between said first region and said second region is 10 to 25°, and said second region has a smaller angle of inclination with respect to the normal direction of the prism row formation plane than said first region.

[20] The light source device according to Claim 19, wherein said second region is positioned further from the top part of said prism rows than said first region.

[21] The light source device according to Claim 19, wherein at least one surface among said first region, said second region and said second prism surface consists of a single plane or curved surface.

[22] The light source device according to Claim 19, wherein said first region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the direction forming the first angle with respect to the normal direction of said prism row formation plane, and said second region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction.

[23] The light source device according to Claim 22, wherein said second angle is positioned on the opposite side of the normal direction of said prism row formation plane from said first angle.

[24] The light source device according to Claim 19, wherein a fifth region is present between said first region and second region.

[25] The light source device according to Claim 24, wherein the inclination angle of said fifth region is smaller than the inclination angle of the first region, but larger than the inclination angle of the second region.

[26] The light source device according to Claim 25, wherein the ratio of the width of said fifth region to the width of said prism rows in the cross section perpendicular to the direction of extension of said prism rows is 10 to 40%.

[27] The light source device according to Claim 25, wherein said first region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the direction forming the first angle with respect to the normal direction of said prism row formation plane, said second region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction, and said fifth region deflects (by inside surface reflection) the light that is emitted from said light emitting surface and introduced into said prism rows from said second prism surface in the normal direction of said prism row formation plane or in a direction in the vicinity of this normal direction.

[28] The light deflecting element according to any of Claims 1 through 27.